

Serial No.: 10/769,777
Docket No.: 101-1015
Amendment dated August 14, 2008
Reply to the Office Action of May 14, 2008

REMARKS

Introduction

Applicants note with appreciation the Examiner's indication that each of the references cited in the Information Disclosure Statement of February 11, 2008 have been considered.

Upon entry of the foregoing amendment, claims 1, 3, 4, 6-10, 13, 16-19, 22, 25-30, 32, 34-36, 39, 42-45, 48, 51-55, and 57 are pending in the application. Claims 1, 25-27, and 51 have been amended. Claims 2, 5, 11, 12, 14, 15, 20, 21, 23, 24, 31, 33, 37, 38, 40, 41, 46, 47, 49, 50, and 56 have been cancelled. No new matter is being presented. In view of the following remarks, reconsideration and allowance of all the pending claims are requested.

Rejection under 35 USC § 101

Claims 25 and 26 have been rejected under 35 U.S.C. §101. Applicants have amended claims 25 and 26, as well as paragraph [0094] of the specification, in order to address the Examiner's concerns and to expedite prosecution of the above-identified patent application. Accordingly, reconsideration of these claims and withdrawal of these rejections is earnestly solicited.

Rejection under 35 USC § 103

Claims 1, 10, 13, 25, 27, 36, 39 and 51 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Mancini et al. (hereinafter "Mancini") in view of U.S. Patent No. 6,529,634 to Thyagarajan et al. (hereinafter "Thyagarajan"). In view of the following remarks, reconsideration and allowance of these claims is earnestly solicited.

Claim 1

Applicants have amended claim 1 to recite, among other things,
setting a plurality of splitting threshold values to compare with a characteristic of

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a macro block in an image frame and determining thereby whether to split the macro block into sub blocks by determining whether the macro block at a same location in a preceding image frame has been split.

On page 6 of the Office Action, the Examiner acknowledges and Applicants agree that Mancini fails to teach or suggest that “the plurality of splitting threshold values for each sub block is different than the plurality of splitting threshold values for a macroblock.” The Examiner contends that Thyagarajan describes

a method of splitting an image block (“decision to subdivide a block” at col. 5, lines 57) comprising:

setting a plurality of splitting threshold values to compare with a characteristic of a macro block in an image frame (“threshold T16 is modified to provide a new threshold T’16 if the mean value of the block is between two predetermined values” at col. 6, line 1); and

setting a plurality of other splitting threshold value to compare with a characteristic of each sub block (“variance threshold T8 is modified to provide a new threshold T’8 if the mean value of the block is between two predetermined values” at col. 6, line 16).

On page 6 of the Office Action, the Examiner contends that

[i]t would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a different splitting threshold for the sub block from the macroblock as taught by Thyagarajan et al. to define the splitting thresholds of Mancini et al. to ensure that “small blocks are assigned even in relatively dark areas” (Thyagarajan et al. at col. 9, line 30) and to preserve “details in all areas that are above just noticeable visibility threshold” (Thyagarajan et al. at col. 9, line 31).

Applicants respectfully submit that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest, among other things,

setting a plurality of splitting threshold values to compare with a characteristic of a macro block in an image frame and determining thereby whether to split the macro block into sub blocks *by determining whether the macro block at a same location in a preceding image frame has been split*

(emphasis added). In contrast, Thyagarajan describes in col. 5, line 66 to col. 6, line 4 that

first the variance threshold T16 is modified to provide a new threshold T’16 if the mean value of the block is between two predetermined values, then the block variance is compared against the new threshold, T’16.

Thus, Thyagarajan illustrates in step 206 of FIG. 2 and describes determining whether to modify

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the variance threshold from T16 to T'16 ("if the mean value of the block is between the two predetermined values"), and, depending on the result, compare the threshold (T16 or T'16) with the variance (v16) of each 16x16 block of the subdivision with the threshold. However, the comparing the "block variance" to the "threshold T16" or to "new threshold T'16" as described by Thyagarajan is distinctly different from "determining thereby whether to split the macro block into sub blocks" by "determining whether the macro block at a same location in a preceding image frame has been split," as neither Mancini and Thyagarajan, whether taken alone or in combination with one another, describe this *anywhere*. Moreover, the Examiner acknowledges and Applicants agree that on page 18 that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest "determining whether a macro block at a same location in a preceding image frame has been split."

Since Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest every element as recited in amended claim 1, claim 1 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim is earnestly solicited.

Claims 10 and 13

With regard to claims 10 and 13, it is requested that for at least the reasons that these claims depend from allowable independent claim 1, and therefore contain each of the features as recited in claim 1, claims 10 and 13 are also patentable over Mancini and Thyagarajan, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Claim 25

Applicants have amended claim 25 to recite, among other things,

setting a plurality of splitting threshold values to compare with a characteristic of a macro block in an image frame and determining thereby whether to split the

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macro block into sub blocks by determining whether the macro block at a same location in a preceding image frame has been split.

On page 7 of the Office Action, the Examiner acknowledges and Applicants agree that Mancini fails to teach or suggest that "the plurality of splitting threshold values for each sub block is different than the plurality of splitting threshold values for a macroblock." On page 8 of the Office Action, the Examiner contends that Thyagarajan describes

setting a plurality of splitting threshold values to compare with a characteristic of a macro block in an image frame ("threshold T16 is modified to provide a new threshold T'16 if the mean value of the block is between two predetermined values" at col. 6, line 1); and

setting a plurality of other splitting threshold value to compare with a characteristic of each sub block ("variance threshold T8 is modified to provide a new threshold T'8 if the mean value of the block is between two predetermined values" at col. 6, line 16).

On page 8 of the Office Action, the Examiner contends that

[i]t would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a different splitting threshold for the sub block from the macroblock as taught by Thyagarajan et al. to define the splitting thresholds of Mancini et al. to ensure that "small blocks are assigned even in relatively dark areas" (Thyagarajan et al. at col. 9, line 30) and to preserve "details in all areas that are above just noticeable visibility threshold" (Thyagarajan et al. at col. 9, line 31).

Applicants respectfully submit that Applicants respectfully submit that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest, among other things,

setting a plurality of splitting threshold values to compare with a characteristic of a macro block in an image frame and determining thereby whether to split the macro block into sub blocks by determining whether the macro block at a same location in a preceding image frame has been split

for at least the same reasons as discussed throughout in connection with claims 1 and 2.

Since Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest every element as recited in amended claim 25, claim 25 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim is earnestly solicited.

Claim 27

Applicants have amended claim 27 to recite, among other things,

a macro block splitting determining unit that sets a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determines therewith whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split.

On page 7 of the Office Action, the Examiner acknowledges and Applicants agree that Mancini fails to teach or suggest that “the plurality of splitting threshold values for each sub block is different than the plurality of splitting threshold values for a macroblock.” On page 8 of the Office Action, the Examiner contends that Thyagarajan describes

setting a plurality of splitting threshold values to compare with a characteristic of a macro block in an image frame (“threshold T16 is modified to provide a new threshold T’16 if the mean value of the block is between two predetermined values” at col. 6, line 1); and

setting a plurality of other splitting threshold value to compare with a characteristic of each sub block (“variance threshold T8 is modified to provide a new threshold T’8 if the mean value of the block is between two predetermined values” at col. 6, line 16).

On page 8 of the Office Action, the Examiner contends that

[i]t would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a different splitting threshold for the sub block from the macroblock as taught by Thyagarajan et al. to define the splitting thresholds of Mancini et al. to ensure that “small blocks are assigned even in relatively dark areas” (Thyagarajan et al. at col. 9, line 30) and to preserve “details in all areas that are above just noticeable visibility threshold” (Thyagarajan et al. at col. 9, line 31).

Applicants respectfully submit that Applicants respectfully submit that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest, among other things,

a macro block splitting determining unit that sets a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determines therewith whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split.

for at least the same reasons as discussed throughout in connection with claims 1 and 2.

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Since Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest every element as recited in amended claim 27, claim 27 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim is earnestly solicited.

Claims 36 and 39

With regard to claims 36 and 39, it is requested that for at least the reasons that these claims depend from allowable independent claim 27, and therefore contain each of the features as recited in claim 27, claims 36 and 39 are also patentable over Mancini and Thyagarajan, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Claim 51

Applicants have amended claim 51 to recite, among other things,

splitting macro image blocks each of left-eye views and right eye views into sub image blocks according to quadtree disparity estimation using a plurality of splitting threshold values and determining not to split the macro block if the macro block at a same location in a preceding image frame has not been split.

On page 11 of the Office Action, the Examiner acknowledges and Applicants agree that Mancini fails to teach or suggest that “the plurality of splitting threshold values for each sub block is different than the plurality of splitting threshold values for a macroblock.” On pages 11 and 12 of the Office Action, the Examiner contends that Thyagarajan describes

splitting macro image blocks into sub image blocks (“subdivided into four 8x8 blocks” at col. 6, line 12) using a plurality of splitting threshold values (“threshold T16 is modified to provide a new threshold T’16 if the mean value of the block is between two predetermined values” at col. 6, line 1); and

splitting each sub block into smaller sub blocks (“8x8 block is to be subdivided into four 4x4 blocks” at col. 6, line 25) using a plurality of other splitting threshold values (“variance threshold T8 is modified to provide a new threshold T’8 if the mean value of the block is between two predetermined

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values" at col. 6, line 16).

On page 12 of the Office Action, the Examiner contends that

[i]t would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize a different splitting threshold for the sub block from the macroblock as taught by Thyagarajan et al. to define the splitting thresholds of Mancini et al. to ensure that "small blocks are assigned even in relatively dark areas" (Thyagarajan et al. at col. 9, line 30) and to preserve "details in all areas that are above just noticeable visibility threshold" (Thyagarajan et al. at col. 9, line 31).

Applicants respectfully submit that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest, among other things,

splitting macro image blocks each of left-eye views and right eye views into sub image blocks according to quadtree disparity estimation using a plurality of splitting threshold values and *determining not to split the macro block if the macro block at a same location in a preceding image frame has not been split* (emphasis added).

In contrast, Thyagarajan describes in col. 5, line 66 to col. 6, line 4 that

first the variance threshold T16 is modified to provide a new threshold T'16 if the mean value of the block is between two predetermined values, then the block variance is compared against the new threshold, T'16.

Thus, Thyagarajan illustrates in step 206 of FIG. 2 and describes determining whether to modify the variance threshold from T16 to T'16 ("if the mean value of the block is between the two predetermined values"), and, depending on the result, compare the threshold (T16 or T'16) with the variance (v16) of each 16x16 block of the subdivision with the threshold. However, the comparing the "block variance" to the "threshold T16" or to "new threshold T'16" as described by Thyagarajan is distinctly different from "setting a plurality of other splitting threshold values to compare with a characteristic of each sub block" by "determining whether the macro block *at a same location* in a *preceding image frame* has been split" (emphasis added) -- neither Mancini and Thyagarajan, whether taken alone or in combination with one another, describe this *anywhere*. Also, on page 20 of the Office Action, the Examiner acknowledges and Applicants agree that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest "determining not to split the macro block if the

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macro block at the same location in a preceding image frame has not been split.”

Since Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest every element as recited in amended claim 51, claim 51 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim is earnestly solicited.

Rejection under 35 USC § 103

Claims 16, 19, 22, 26, 42, 45 and 48 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mancini in view of Thyagarajan and further in view of U.S. Patent No. 6,304,606 to Murashita et al. (hereinafter “Murashita”). Applicants respectfully traverse these rejections for at least the following reasons.

Claim 16

On page 14 of the Office Action, the Examiner acknowledges and Applicants agree that Mancini fails to teach or suggest, among other things, “that the plurality of splitting threshold values for each sub block is different than the plurality of splitting threshold values for a macroblock.” On page 15 of the Office Action, the Examiner acknowledges and Applicants agree that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest “determining whether a macro block at a same location in a preceding image frame has been split and determining whether a sub block at a same location in a preceding image frame has been split.” On pages 15 and 16, the Examiner contends that Murashita describes

determining whether to split the block (“When the image data of the present frame changes from that of the preceding frame, the image data of the first block is coded” at col. 13, line 31; “coding may be performed by using an orthogonal transform such as ADCT” at col. 13, line 49) by determining whether a block at a same location in a preceding image has been split (“the image element in the first block of the present frame is compared with the image element of the first block of the preceding frame with the position of the image element and block of the

present frame being the same as those of the preceding frame, thereby determining whether the first block of the present frame is a valid block in which the image is different from that in the first block of the preceding frame” at col. 12, line 48).

The Examiner contends that

[i]t would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the block comparison of Murashita et al. on the macro blocks of the Mancini et al. and Thyagarajan et al. combinations as “the amount of coded data can be reduced greatly in the case of the frame including a large background portion in which the image does not change” (Murashita et al. at col. 14, line 6).

Applicants respectfully submit that Mancini, Thyagarajan, and Murashita, whether taken along or in combination with one another, fail to teach or suggest, among other things,

setting a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determining whether to split the macro block *by determining whether a macro block at a same location in a preceding image frame has been split* (emphasis added)

for at least the same reasons as discussed throughout in connection with claims 1 and 2.

Applicants respectfully submit that Mancini, Thyagarajan, and Murashita, whether taken along or in combination with one another, fail to teach or suggest, among other things,

setting a plurality of sub block splitting threshold values for splitting the sub block into smaller sub blocks and determining whether to split the sub block into smaller sub blocks *by determining whether a sub block at a same location in the preceding image frame has been split* (emphasis added).

In contrast, Murashita illustrates in FIG. 6 and describes at col. 12, lines 47-55 that

the image element in the first block of the present frame is compared with the image element of the first block of the preceding frame with the position of the image element and block of the present frame being the same as those of the preceding frame, thereby determining whether the first block of the present frame is a valid block in which the image is different from that in the first block of the preceding frame (S1, S2).

As described by Murashita in col. 14, lines 1-8

only the image data of the valid block in which the image data in the block in the present frame changes from the corresponding one in the corresponding block in the preceding frame is selected and encoded, and thus the amount of the coded data can be reduced greatly in the case of the frame including a large background portion in which the image does not change.

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Murashita merely describes determining whether the image data in “the first block of the present frame” is different from the image data in “the first block of the preceding frame.” This is distinctly different from “determining ... *whether to split each sub block into smaller sub blocks*” (emphasis added). Not only does Murashita fail to teach or suggest “determining ... whether to split each sub block into smaller sub blocks,” but also fails to teach or suggest that this “determining” is performed by “by determining whether a sub block at a same location in the preceding image frame has been split” – Murashita never considers whether a sub block has been split into smaller sub blocks in the comparison between the first block of the present frame with the first block of the preceding frame.

Since Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another, fail to teach or suggest every element as recited in claim 16, claim 16 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim is earnestly solicited.

Claims 19 and 22

With regard to claims 19 and 22, it is requested that for at least the reasons that these claims depend from allowable independent claim 16, and therefore contain each of the features as recited in claim 16, claims 19 and 22 are also patentable over Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Claim 26

On page 16 of the Office Action, the Examiner contends that the Mancini et al., Thyagarajan et al. and Murashita et al. combination discloses a recording medium on which a method is written as a program code that can be read and executed on a computer (it is inherent that the method is written on a recording medium to enable the method to [sic] performed) that performs the method as described in the rejection of claim 16 above.

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Applicants respectfully submit that Mancini, Thyagarajan, and Murashita, whether taken along or in combination with one another, fail to teach or suggest, among other things, setting a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determining whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split

for at least the same reasons as discussed in connection with claim 16.

Applicants respectfully submit that Mancini, Thyagarajan, and Murashita, whether taken along or in combination with one another, fail to teach or suggest, among other things, setting a plurality of sub block splitting threshold values for splitting the sub block into smaller sub blocks and determining whether to split the sub block into smaller sub blocks by determining whether the sub block at a same location in the preceding image frame has been split

for at least the same reasons as discussed in connection with claim 16.

Since Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another, fail to teach or suggest every element as recited in claim 26, claim 26 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim is earnestly solicited.

Claim 42

On page 16 of the Office Action, the Examiner contends that the “Mancini et al., Thyagarajan et al. and Murashita et al. combination discloses an apparatus (an apparatus is inherent to carry out the function of the method) that performs the method as described in the rejection of claim 16.”

Applicants respectfully submit that Mancini, Thyagarajan, and Murashita, whether taken along or in combination with one another, fail to teach or suggest, among other things, a macro block splitting determining unit that sets a plurality of macro block splitting threshold values for splitting a macro block in an image frame into sub blocks and determines whether to split the macro block by determining whether the macro block at a same location in a preceding image frame has been split

for at least the same reasons as discussed in connection with claim 16.

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Applicants respectfully submit that Mancini, Thyagarajan, and Murashita, whether taken along or in combination with one another, fail to teach or suggest, among other things, a sub block splitting determining unit that sets a plurality of sub block splitting threshold values for splitting each sub block into smaller sub blocks and determines whether to split each sub block by determining whether the sub block at a same location in the preceding image frame has been split

for at least the same reasons as discussed in connection with claim 16.

Since Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another, fail to teach or suggest every element as recited in claim 42, claim 42 is patentably distinguishable and deemed to be allowable.

Accordingly, withdrawal of this rejection and allowance of this claim is earnestly solicited.

Claims 45 and 48

With regard to claims 45 and 48, it is requested that for at least the reasons that these claims depend from allowable independent claim 42, and therefore contain each of the features as recited in claim 42, claims 45 and 48 are also patentable over Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Rejection under 35 USC § 103

Claims 2, 3, 28, 29, 52, 56 and 57 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mancini in view of Thyagarajan and further in view of Murashita. Applicants respectfully traverse these rejections for at least the following reasons.

Claims 2 and 3

With regard to claim 2, Applicants have amended claim 1 to incorporate the features of claim 2, and have cancelled claim 2. On page 18 of the Office Action, the Examiner

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acknowledges and Applicants agree that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest “determining whether a macro block at a same location in a preceding image frame has been split.” The Examiner contends that Murashita describes

a method of splitting an image block (“respective blocks obtained by dividing the image data” at col. 1, line 20) comprising:

determining whether to split the block (“When the image data of the present frame changes from that of the preceding frame, the image data of the first block is coded” at col. 13, line 31; “coding may be performed by using an orthogonal transform such as ADCT” at col. 13, line 49) by determining whether a block at a same location in a preceding image has been split (“the image element in the first block of the present frame is compared with the image element of the first block of the preceding frame with the position of the image element and block of the present frame being the same as those of the preceding frame, thereby determining whether the first block of the present frame is a valid block in which the image is different from that in the first block of the preceding frame” at col. 12, line 48).

The Examiner contends that

[i]t would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the block comparison of Murashita et al. on the macro blocks of the Mancini et al. and Thyagarajan et al. combinations as “the amount of coded data can be reduced greatly in the case of the frame including a large background portion in which the image does not change” (Murashita et al. at col. 14, line 6).

Applicants respectfully submit that Mancini, Thyagarajan, and Murashita, whether taken alone or in combination with one another, fail to teach or suggest, among other things, determining whether to “split the macro block into sub blocks” by “determining whether the macro block at a same location in a preceding image frame has been split” as recited in amended independent claim 1. In contrast, Murashita illustrates in FIG. 6 and describes at col. 12, lines 47-55 that

the image element in the first block of the present frame is compared with the image element of the first block of the preceding frame with the position of the image element and block of the present frame being the same as those of the preceding frame, thereby determining whether the first block of the present frame is a valid block in which the image is different from that in the first block of the preceding frame (S1, S2).

As described by Murashita in col. 14, lines 1-8

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only the image data of the valid block in which the image data in the block in the present frame changes from the corresponding one in the corresponding block in the preceding frame is selected and encoded, and thus the amount of the coded data can be reduced greatly in the case of the frame including a large background portion in which the image does not change.

Murashita merely describes determining whether the image data in “the first block of the present frame” is different from the image data in “the first block of the preceding frame.” This is distinctly different from “determining ... *whether to split each macro block into sub blocks*” (emphasis added). Not only does Murashita fail to teach or suggest “determining ... whether to split each macro block into sub blocks,” but also fails to teach or suggest that this “determining” is performed by “determining whether the macro block at a same location in a preceding image frame *has been split*” (emphasis added) – Murashita never considers whether the first block has been split in the comparison between the first block of the present frame with the first block of the preceding frame.

With regard to claim 3, it is requested that for at least the reasons that this claim depends from allowable independent claim 1, and therefore contains each of the features as recited in claim 1, claim 3 is also patentable over Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Claims 28 and 29

With regard to claims 28 and 29, it is requested that for at least the reasons that these claims depend from allowable independent claim 27, and therefore contain each of the features as recited in claim 27, claims 28 and 29 are also patentable over Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

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Claim 52

With regard to claim 52, it is requested that for at least the reasons that this claim depends from allowable independent claim 25, and therefore contains each of the features as recited in claim 25, claim 52 is also patentable over Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Claims 56 and 57

With regard to claim 56, Applicants have amended claim 51 to incorporate the features of claim 56, and have cancelled claim 56. On page 20 of the Office Action, the Examiner acknowledges and Applicants agree that Mancini and Thyagarajan, whether taken alone or in combination with one another, fail to teach or suggest “determining not to split the macro block if the macro block at a same location in a preceding image frame has not been split.” On pages 20 and 21 of the Office Action, the Examiner contends that Murashita describes

determining not to split the block (“When the image data of the present frame changes from that of the preceding frame, the image data of the first block is coded” at col. 13, line 31; “coding may be performed by using an orthogonal transform such as ADCT” at col. 13, line 49) if the block at a same location in a preceding image frame (“image element in the first block of the present frame is compared with the image element of the first block of the preceding frame” at col. 12, line 48) has not been split (unchanging background blocks are not coded and split, which propagates through refresh).

The Examiner contends that

[i]t would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the block comparison of Murashita et al. on the macro blocks of the Mancini et al. and Thyagarajan et al. combinations as “the amount of coded data can be reduced greatly in the case of the frame including a large background portion in which the image does not change” (Murashita et al. at col. 14, line 6).

Applicants respectfully submit that Mancini, Thyagarajan, and Murashita, whether taken alone or in combination with one another, fail to teach or suggest, among other things, “determining not to split the macro block if the macro block at a same location in a preceding

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image frame has not been split” as recited in amended independent claim 51. In contrast, Murashita illustrates in FIG. 6 and describes at col. 12, lines 47-55 that

the image element in the first block of the present frame is compared with the image element of the first block of the preceding frame with the position of the image element and block of the present frame being the same as those of the preceding frame, thereby determining whether the first block of the present frame is a valid block in which the image is different from that in the first block of the preceding frame (S1, S2).

As described by Murashita in col. 14, lines 1-8

only the image data of the valid block in which the image data in the block in the present frame changes from the corresponding one in the corresponding block in the preceding frame is selected and encoded, and thus the amount of the coded data can be reduced greatly in the case of the frame including a large background portion in which the image does not change.

Murashita merely describes determining whether the image data in “the first block of the present frame” is different from the image data in “the first block of the preceding frame.” This is distinctly different from “determining not to split the macro block if the macro block at a same location in a preceding image frame has not been split,” as Murashita never considers whether the first block has been split in the comparison between the first block of the present frame with the first block of the preceding frame.

With regard to claim 57, it is requested that for at least the reasons that this claim depends from allowable independent claim 51, and therefore contain each of the features as recited in claim 51, claim 57 is also patentable over Mancini, Thyagarajan, and Murashita whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of claim 57 is earnestly solicited.

Rejection under 35 USC § 103

Claims 4, 6, 30 and 32 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mancini in view of Thyagarajan and further in view of U.S. Patent No. 5,208,673 to Boyce (hereinafter “Boyce”). Applicants respectfully traverse these rejections for at least the following reasons.

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Claims 4 and 6

With regard to claims 4 and 6, it is requested that for at least the reasons that these claims depend from allowable independent claim 1, and therefore contain each of the features as recited in claim 1, claims 4 and 6 are also patentable over Mancini, Thyagarajan, and Boyce, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Claims 30 and 32

With regard to claims 30 and 32, it is requested that for at least the reasons that these claims depend from allowable independent claim 27, and therefore contain each of the features as recited in claim 27, claims 30 and 32 are also patentable over Mancini, Thyagarajan, and Boyce, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Rejection under 35 USC § 103

Claims 17, 18, 43, 44 and 53 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mancini in view of Thyagarajan in view of Murashita and further in view of Boyce. Applicants respectfully traverse these rejections for at least the following reasons.

Claims 17 and 18

With regard to claims 17 and 18, it is requested that for at least the reasons that these claims depend from allowable independent claim 16, and therefore contain each of the features as recited in claim 16, claims 17 and 18 are also patentable over Mancini, Thyagarajan, Murashita, and Boyce, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly

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solicited.

Claims 43, 44, and 53

With regard to claims 43, 44, and 53, it is requested that for at least the reasons that these claims depend from allowable independent claim 42, and therefore contain each of the features as recited in claim 42, claims 43, 44, and 53 are also patentable over Mancini, Thyagarajan, Murashita, and Boyce, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Rejection under 35 USC § 103

Claims 5 and 7 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mancini in view of Thyagarajan in view of Murashita and further in view of Boyce. Applicants respectfully traverse these rejections for at least the following reasons.

With regard to claim 5, Applicants have cancelled this claim.

With regard to claim 7, it is requested that for at least the reason that this claim depends from allowable independent claim 1, and therefore contain each of the features as recited in claim 1, claim 7 is also patentable over Mancini, Thyagarajan, Murashita, and Boyce, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of claim 7 is earnestly solicited.

Rejection under 35 USC § 103

Claims 8, 9, 34 and 35 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mancini in view of Thyagarajan in view of Boyce and further in view of Murashita. Applicants respectfully traverse these rejections for at least the following reasons.

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Claims 8 and 9

With regard to claims 8 and 9, it is requested that for at least the reasons that these claims depend from allowable independent claim 1, and therefore contain each of the features as recited in claim 1, claims 8 and 9 are also patentable over Mancini, Thyagarajan, Murashita, and Boyce, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Claims 34 and 35

With regard to claims 34 and 35, it is requested that for at least the reasons that these claims depend from allowable independent claim 27, and therefore contain each of the features as recited in claim 27, claims 34 and 35 are also patentable over Mancini, Thyagarajan, Murashita, and Boyce, whether taken alone or in combination with one another.

Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Rejection under 35 USC § 103

Claims 54 and 55 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mancini in view of Thyagarajan in view of Murashita and further in view of common knowledge in the art. Applicants respectfully traverse these rejections for at least the following reasons.

With regard to claims 54 and 55, it is requested that for at least the reasons that these claims depend from allowable independent claim 42, and therefore contain each of the features as recited in claim 42, claims 54 and 55 are also patentable over Mancini, Thyagarajan, Murashita, and common knowledge in the art, whether taken alone or in combination with one another.

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Accordingly, withdrawal of these rejections and allowance of these claims is earnestly solicited.

Conclusion

It is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, there being no other objections or rejections, this application is in condition for allowance, and a notice to this effect is earnestly solicited.

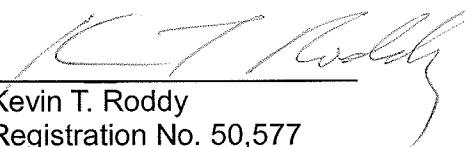
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided below.

If any further fees are required in connection with the filing of this amendment, please charge the same to our Deposit Account No. 502827.

Respectfully submitted,

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